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Project Nexus Allocation Options

Comparison of Results
DESC Technical Workgroup
19 March 2013

Project Nexus Allocation - Recap

- Project Nexus proposes move to universal Meter Point Reconciliation
- Also proposes replacing RbD with industry-wide energy smear
 - Allocation Scaling Adjustment
 - Reconciliation Scaling Adjustment
- Requires an improved allocation process to reduce cross-subsidies at point of allocation

Background

- Project Nexus UNC Workgroup asked DESC to define a new approach to NDM estimation to support Allocation in the Project Nexus regime
- DESC delegated the work to Technical Workgroup

Project Nexus New Allocation Algorithm - Principles

- The following represents a draft set of principles, as discussed at the December 2011 DESC meeting, which should be applied by DESC when considering options for a new allocation algorithm
- Final methodology selected should....
 - be transparent to all Users and Transporters
 - be future-proof – i.e. calculation is as robust during roll-out as it is in a fully smart world
 - be evidence-based using statistical measures agreed by DESC
 - still require the need for a ‘Scaling Factor’ of some description to ensure all parties contribute to ‘unaccounted for’ gas
 - aim to ensure all sectors are treated equally and not unfairly disadvantaged
 - ensure outcomes from Nominations and Allocations process are consistent or more consistent with each other
 - be efficient in terms of costs and benefits realised

Project Nexus New Allocation Algorithm – Principles – Success Criteria

- The following represents a set of updated success criteria to be referred to by DESC when finalising views on a new allocation algorithm
 - Allocation process results in the same or better accuracy in apportionment of energy across sectors thus reducing levels of reconciliation compared to current regime
 - Day ahead gas Nominations are as accurate or more accurate for NDM sector
 - Supported by majority of Users and Transporters within the industry
 - Solution developed within a reasonable time scale to support Project Nexus
 - New process still supports other industry processes, e.g. AQ and SOQ derivation

Explanation of Results

- Differences between Actual consumption and Predicted consumption analysed
- For avoidance of doubt the residuals 'performance' have been expressed as the following statistic
- $$\text{MAPE} = \frac{\text{Sum} (| \text{Actual} - \text{Predicted} | / \text{Actual})}{n} \times 100$$
- $$\text{MPE} = \frac{\text{Sum} (\text{Predicted} - \text{Actual} / \text{Actual})}{n} \times 100$$
 - Negative MPE = Under Allocation
 - Positive MPE = Over Allocation
 - n = number of observations in group – e.g. Day of Week, Calendar month etc

Summary of 3 Options Under Investigation

- Option A – average demand from a sample of smart meters scaled up/down to other sites in the same “class” (EUC or similar grouping)
- Option C – regression formula based on relationship of gas demand for a “class” to up to [six] weather data items and other non-weather parameters such as day of week, time of year; use of actual weather data each day to predict demand for that “class” based on the formula
- Options E – amendment to current allocation formula, to use actual weather data in deriving the weather correction factor and to remove the Scaling Factor from the formula

Available Results

- Summary of the available results from the analysis

	Option A	Option C	Option E
2010/11	<ul style="list-style-type: none"> •Complete for 2 LDZs (EM / WM) for 01B •Complete for NW LDZ for 04B 	<ul style="list-style-type: none"> •Complete for 10 LDZs for all EUCs 	<ul style="list-style-type: none"> •Complete for 12 LDZs for all EUCs
2011/12	<ul style="list-style-type: none"> •Complete for 4 LDZs (EM/NW/SO/WM) for 01B •Complete for NW LDZ for 04B 	<ul style="list-style-type: none"> •Complete for 10 LDZs for all EUCs <p>NB Additional data set C2 provided where 2 years data used to train model</p>	<ul style="list-style-type: none"> •Complete for 12 LDZs for all EUCs

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2010/11 (Mon-Thu and Fri comparisons)

MAPE

	NW	EM	WM	SO
Mon-Thu				
01B	E	C	C	C
02B	E	E	E	E
03B	E	E	E	E
04B	E	E	E	E
05B	E	C	E	E
06B	E	E	E	E
07B	E	E	E	C
08B	E	E	C	C

Fri				
01B	E	C	C	E
02B	E	E	E	E
03B	E	E	C	E
04B	E	E	E	E
05B	E	E	C	C
06B	E	E	C	C
07B	E	E	C	C
08B	E	E	C	C

TOTAL BY EUC

OPTION A	OPTION C	OPTION E
0	3	1
0	0	4
0	0	4
0	0	4
0	1	3
0	0	4
0	1	3
0	2	2
0	7	25

0	2	2
0	0	4
0	1	3
0	0	4
0	2	2
0	2	2
0	2	2
0	2	2
0	11	21

Note: Data only available for Option A for EM / WM for 01B and NW for 04B



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2010/11 (Sat and Sun comparisons)

MAPE

	NW	EM	WM	SO
Sat				
01B	E	C	C	C
02B	E	E	E	E
03B	E	E	E	E
04B	E	E	E	E
05B	E	E	C	E
06B	E	E	E	C
07B	E	E	C	C
08B	E	E	E	E

Sun

01B	E	C	C	C
02B	E	E	E	E
03B	E	E	E	E
04B	E	E	E	E
05B	E	E	C	E
06B	E	E	C	C
07B	E	E	C	C
08B	E	E	C	C

TOTAL BY EUC

OPTION A	OPTION C	OPTION E
0	3	1
0	0	4
0	0	4
0	0	4
0	1	3
0	1	3
0	2	2
0	0	4
0	7	25

0	3	1
0	0	4
0	0	4
0	0	4
0	1	3
0	2	2
0	2	2
0	2	2
0	10	22

Note: Data only available for Option A for EM / WM for 01B and NW for 04B



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2010/11 (Winter and Summer comparisons)

MAPE Analysis

Oct-Mar	Total for all 4 LDZs		
	OPTION A	OPTION C	OPTION E
01B	9	3	12
02B	0	5	19
03B	0	1	23
04B	0	3	21
05B	0	6	18
06B	0	8	16
07B	0	10	14
08B	0	7	17
	9	43	140

Apr-Sep	Total for all 4 LDZs		
	OPTION A	OPTION C	OPTION E
01B	1	14	9
02B	0	1	23
03B	0	6	18
04B	0	9	15
05B	0	8	16
06B	0	4	20
07B	0	10	14
08B	0	8	16
	1	60	131

Total by LDZ	NW	EM	WM	SO
OPTION A	0	5	4	0
OPTION C	0	8	15	20
OPTION E	48	35	29	28

Total by LDZ	NW	EM	WM	SO
OPTION A	0	0	1	0
OPTION C	0	16	22	22
OPTION E	48	32	25	26

Note: Data only available for Option A for EM / WM for 01B and NW for 04B

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2011/12 (Mon-Thu and Fri comparisons)

MAPE

	NW	EM	WM	SO
Mon-Thu				
01B	E	E	E	C
02B	E	E	E	E
03B	E	E	E	C
04B	E	E	E	E
05B	E	C	C	E
06B	E	E	C	E
07B	E	E	E	E
08B	E	E	E	C
Fri				
01B	E	E	E	C
02B	E	E	E	E
03B	E	C	C	C
04B	E	C	C	E
05B	E	E	C	C
06B	E	E	C	E
07B	E	E	E	E
08B	E	E	E	C

TOTAL BY EUC

OPTION A	OPTION C	OPTION E
0	1	3
0	0	4
0	1	3
0	0	4
0	2	2
0	1	3
0	0	4
0	1	3
0	6	26
0	1	3
0	0	4
0	3	1
0	2	2
0	2	2
0	1	3
0	0	4
0	1	3
0	10	22

Note: Data only available for Option A for EM / NW / SO / WM for 01B and NW for 04B



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2011/12 (Sat and Sun comparisons)

MAPE

	NW	EM	WM	SO
Sat				
01B	E	E	C	C
02B	E	E	E	E
03B	E	E	E	E
04B	E	E	E	E
05B	E	E	E	E
06B	E	C	C	E
07B	E	E	E	E
08B	E	E	E	C
Sun				
01B	E	E	E	C
02B	E	E	E	E
03B	E	E	E	E
04B	E	E	E	E
05B	E	E	C	E
06B	E	E	C	C
07B	E	E	E	E
08B	E	E	E	E

TOTAL BY EUC

OPTION A	OPTION C	OPTION E
0	2	2
0	0	4
0	0	4
0	0	4
0	0	4
0	2	2
0	0	4
0	1	3
0	5	27
0	1	3
0	0	4
0	0	4
0	0	4
0	1	3
0	2	2
0	0	4
0	0	4
0	4	28

Note: Data only available for Option A for EM / NW / SO / WM for 01B and NW for 04B



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2011/12 (Winter and Summer comparisons)

MAPE Analysis

Oct-Mar	Total for all 4 LDZs		
	OPTION A	OPTION C	OPTION E
01B	7	8	9
02B	0	3	21
03B	0	8	16
04B	0	4	20
05B	0	8	16
06B	0	10	14
07B	0	3	21
08B	0	4	20
	7	48	137

Apr-Sep	Total for all 4 LDZs		
	OPTION A	OPTION C	OPTION E
01B	0	10	14
02B	0	3	21
03B	0	7	17
04B	0	6	18
05B	0	9	15
06B	0	9	15
07B	0	2	22
08B	0	8	16
	0	54	138

Total by LDZ	NW	EM	WM	SO
OPTION A	0	2	4	1
OPTION C	0	19	18	11
OPTION E	48	27	26	36

Total by LDZ	NW	EM	WM	SO
OPTION A	0	0	0	0
OPTION C	0	18	12	24
OPTION E	48	30	36	24

Note: Data only available for Option A for EM / NW / SO / WM for 01B and NW for 04B

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Option C analysis

- Two versions of output provided by British Gas.
 - a) Regression trained on one year of data providing results for 2010/11 and 2011/12
 - b) Regression trained on two years of data providing results for 2011/12
- Comparison could only be carried out for 2011/12 data.
 - Initial comparison between C1 and C2 showed C2 was better (i.e. MAPE closer to 0) than C1 for the majority of LDZs apart for SC.
 - Comparison of the results from C1 and C2 against Option A and E showed some improvement by using C2 but overall it still wasn't as good as Option E (and only one year of data to compare)
- Note All the previous results in slides 9-14 have been based on Options A, C1 and E

Assessment Against Success Criteria

<i>Assessment (1=low, 5=high)</i>	Option A	Option C	Option E
Allocation process results in the same or better accuracy in apportionment of energy across sectors			
Day ahead gas Nominations are as accurate or more accurate for NDM sector			
Supported by majority of Users and Transporters within the industry			
Solution developed within a reasonable time scale to support Project Nexus			
New process still supports other industry processes, e.g. AQ and SOQ derivation			